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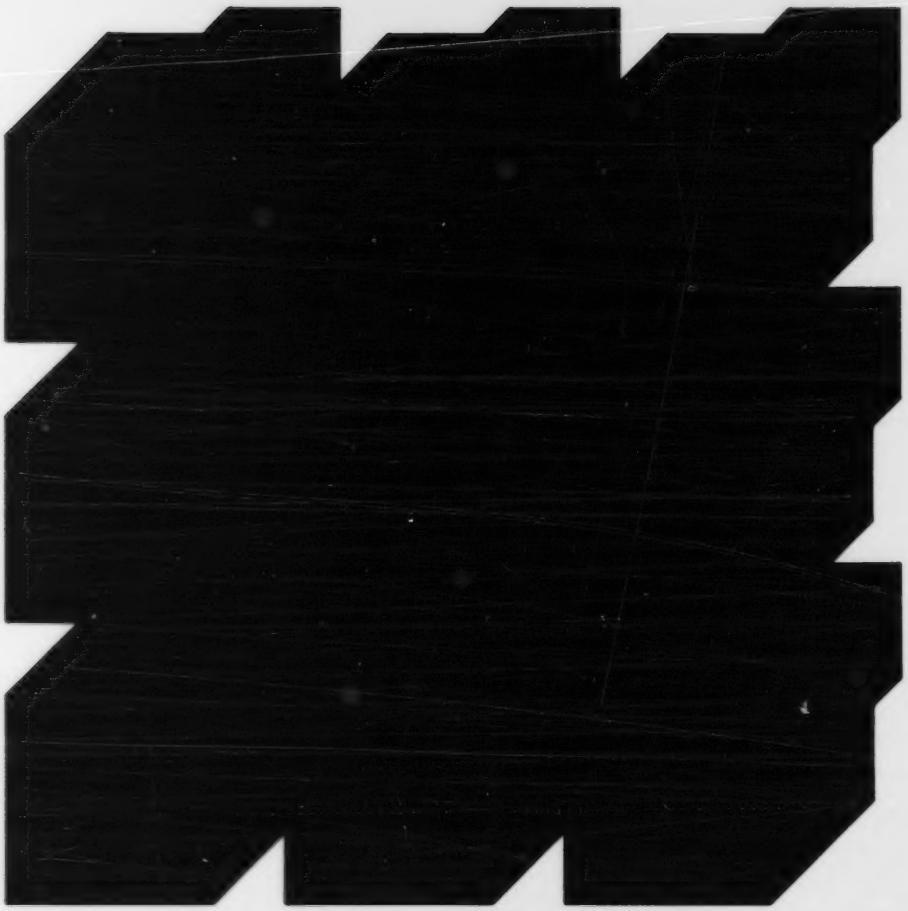

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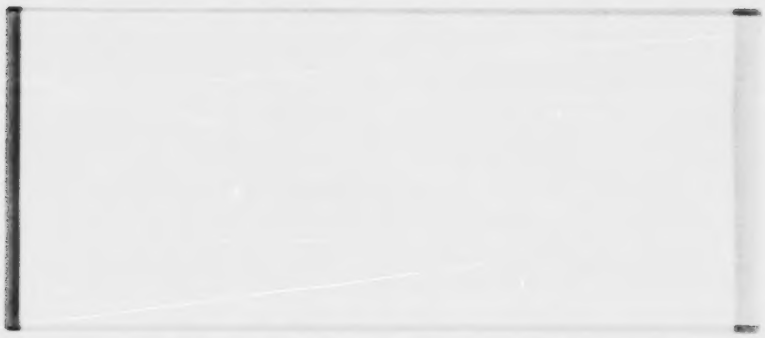

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DISCUSSION PAPER NO. 336

Macroeconomics and the Canadian Income-Security System: An Overview

by

Pierre Perron

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RÉSUMÉ

Ce document examine les effects macroéconomiques des divers programmes de sécurité du revenu au Canada. Nous avons pris connaissance de la plupart des ouvrages récents sur ce sujet. Quatre ensembles de programmes sont présentés, en rapport avec différents groupes sociaux : les pauvres, les personnes âgées, les ménages et les chômeurs. Nous avons attaché la plus grande attention à tous les effets qui ne sont pas directement rattachés aux distorsions créées, sur le marché du travail, par l'évolution des incitations au travail. Nous nous sommes donc préoccupés surtout des décisions d'épargne et de consommation des ménages, ainsi que de leurs effets concomitants sur diverses variables comme le capital social, les taux de croissance de l'économie, l'inflation, les taux de chômage, et le reste. Nous analysons également les effets des conditions économiques elles-mêmes sur les programmes de sécurité du revenu et sur le niveau de pauvreté; nous nous sommes particulièrement attardés à la portée de la croissance générale du PNB sur le niveau de pauvreté. Pour chacun des cas, nous présentons des considérations d'ordre théorique aussi bien que les données empiriques sur lesquelles elles se fondent.

ABSTRACT

This study considers the macroeconomic effects of the various income-security programs in Canada. We review the recent literature on this subject somewhat extensively. Four sets of programs are considered as they refer to different groups in the economy: the poor, the elderly, the family and the unemployed. Most of our attention centers on effects other than those directly related to distortions created in the labor market by changes in incentives to work. Thus our main concerns are the saving-consumption decisions of the household and their concomitant effects on variables such as: the capital stock, growth rates of the economy, inflation, the unemployment rate, etc. We also analyse the effects of economic conditions themselves on the income security programs and the level of poverty; in particular the influence of the overall growth in GNP on the poverty level. In each case we present both the theoretical considerations and the empirical evidence found to support them.

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FOREWORD

This paper represents part of the Council's social policy project. The purpose of this project is to study the links and trade-offs between economic activity and income-security programs in ways that permit an evaluation of the distributional impact of the programs and the economic costs of their potential reforms.

This paper, the second in a series, considers the macro-economic effects of various Canadian income-security programs as well as the effect of macro-economic fluctuations on poverty rates. The paper reviews theoretical considerations and empirical evidence of the interaction between economic activity and income-security programs.

Additional and original empirical evidence on this subject will appear in a separate paper on which the author is one of the collaborators.

The author is a professor of economics at the University of Montreal.

Judith Maxwell
Chairman

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1. INTRODUCTION

For the last thirty or forty years, governments of the industrialized countries have increasingly replaced private (mostly family) mechanisms that had traditionally provided income maintenance in the face of various adverse conditions. The need for government intervention appears to be due, in large part, to the growing inadequacy of provisions offered by the existing channels of redistribution. Generally, it can be said that unconstrained market forces lead to an ethically unacceptable distribution of income, whether the causes be luck, health, differences in endowment or simply the mechanisms of the economic system itself. The Great Depression highlighted this last point.

The timing of the widespread introduction of government intervention for welfare purposes is certainly connected with the phenomenal growth experienced in the post-World War II era. Indeed, the growth in real per capita GNP in the 30 years or so following World War II was about the same as the growth experienced in the previous two centuries (since the Industrial Revolution). Such an increase in real resources implies that the opportunity cost of providing various welfare programs had decreased (see Abramowitz (1981)). This economic growth, mainly due to increases in productivity, easily paid for the pursuit of welfare goals. Although the government share of total resources grew faster than GNP, the magnitude of the real increases also permitted a rise in per capita disposable income. Welfare programs were, therefore, a part of the productivity growth process itself; and growth was possibly the basis for a consensus supporting the development of a mixed economy.

It is often argued that this combination of growth with the implementation and expansion of welfare programs is responsible for the substantial decrease in the number of individuals with real disposable income below (some officially measured) poverty level. For example, in Canada, the percentage of families below the poverty level (as defined by

Statistics Canada based on shares of expenditures on necessities) went from 27.9% in 1961 to 12% in 1981 (Vaillancourt (1986) p. 21).[1]

Since the mid-seventies, economic growth has slowed considerably. Indeed, the presumption is that the real disposable income of an average single-worker family has declined (Abramowitz (1981), p. 6). Just as the growth process 30 years ago was, in large part, responsible for the increase in welfare programs, the current low level of growth is responsible for today's concern about them. The causes of the current economic retardation are largely unknown. However, some argue that both welfare and regulatory programs have direct effects. In Canada, the share of welfare programs (including health and education) has risen from 6.5% of GNP in 1951 to 18.4% in 1981 (Vaillancourt (1986), p. 41). With such a significant presence, these programs must indeed have important aggregate economic implications, although the direction of their effect is a priori unknown.

The fact that welfare programs may have caused a significant portion of the slowdown in growth has profound implications for the future course of economic and social policy. Notwithstanding that slower growth induces people to be less willing to bear the cost of welfare programs, the reluctance to these programs would be emphasized if they actually reduced real disposable income.

The interaction between welfare programs and economic conditions has often been represented by the 'equity-efficiency' trade-off. This trade-off encapsulates the main criticism of the current welfare system. By trying to achieve greater equity in the distribution of income, it is argued that the welfare programs alter the economic incentives facing the agents. First there is the widening differential between before and after tax rates of return to work, saving, investment and risk taking. Secondly, the various insurance and income-support programs also have effects on individual savings and work decisions. These direct effects have potential repercussions on aggregate economic variables such as growth rates, interest rate, consumption, investment, international

competitiveness, factor costs in production, public debt and also for economic stabilization.

By understanding the magnitude and direction of these effects, one can gain some understanding of the nature of the equity-efficiency trade-off. Furthermore, once the nature of such alterations to economic incentives is recognized, one can better judge the appropriateness of proposed changes intended to transform favorably equity-efficiency conditions.

The purpose of this paper is to analyse the effects of the various welfare programs on aggregate economic variables other than those directly related to work incentives.[2] Therefore, the analysis focuses on the effects of the programs on the saving-consumption decisions of the households and their concomitant effects on the variables listed above. We shall also analyse the reverse effects, namely those of general economic conditions on the welfare programs directly.

Note also that we shall only consider the effects and desirability of the various programs, to be described below, from a purely economic point of view. By this we mean that we shall ignore the possible effects of the actual political process by which the programs come to be implemented. For example, Browning (1975) argues that, if government-mandated pensions are a result of a majority voting process with the old outvoting the young, their equilibrium level is inefficient.[3] Considerations such as this one are outside the scope of this paper.

The study is also restricted to programs which provide cash to households as opposed to in-kind (or services) programs such as medical health insurance and education. The main programs are: age-related assistance (e.g. public pension plans), unemployment-related assistance (e.g. unemployment insurance), child-related assistance (e.g. family allowance, etc.), and poor-related assistance (e.g. Canada's assistance plans). The focus of the study is on federally-sponsored programs, since

they form the biggest share of total redistributive measures, although the analysis and the policy implications can be applied to many provincially and municipally- sponsored programs.

With the exceptions of health insurance, education programs and personal tax exemptions,[4] the total cost of the various programs at the federal and provincial level amounts to approximately $60 billion in 1984-85. This sum represents over 13 percent of Canada's gross national product (GNP). Approximately 75 % of this sum is sponsored by the federal government and 25 % by the provincial governments. The major programs of the system are: Unemployment Insurance ($11.6 billion), Old Age Security ($11.4 billion), Child Tax Exemptions ($1.4 billion), the Child Tax Credit ($1.1 billion) and married exemptions ($2 billion).

Recently, the Royal Commission on the Economic Union and Development Prospects for Canada paid some attention to the current Canadian-Income-Security System. Their commissioners noted the following general criticisms levelled against the current income-security program: 1) its ineffectiveness (too many individuals are still living in poverty and too many payments are made to the non-poor); 2) its complexity; 3) its negative effects on work incentives; 4) its inequitability (especially the regressivity of tax exemptions); and 5) the precariousness of its existence due to changes in demographic conditions and the projection of continued high unemployment rates.

With respect to the specific intent of the present study, we may add the following more specific criticisms which are not directly related to work incentives. First, consider age-related programs which ensure some level of economic support for retirement (CPP/QPP, OAS, GIS). It is generally argued that the current pay-as-you go financing system depresses personal savings with all the concomitant effects this may have on investment, the building of capital stock and the eventual growth rate of the economy. In this respect, the current debate over public pension plans centers around whether to institute a fully-funded program in which each individual (or more precisely, each generation) receives, in

retirement, the proceeds of what they put in the fund during their working years. Other worries about current pension plan benefits concern the adequacy of the level of benefits; some even question the appropriateness of a role for government in this domain. These concerns originate with the realization that recent demographic changes entail that in the near future a smaller workforce will have to support an increasing number of potential beneficiaries. Another element in the debate is the recent history of inflation.

The Unemployment Insurance program has been a major target of criticism in the recent past. The main concern is, of course, on the work disincentives it may provide. Though outside the scope of this study, this point is, however, obviously related to matters of overall growth. Incidental effects include the possible negative impact on saving.

The current family-related programs are mainly criticised because of the regressive nature of child tax deductions and the inadequacy of suport for low-income families. Some of these ethical matters will be discussed in Section 6. We shall also comment on the possible effects of these programs and proposed changes on the pattern of aggregate consumption.

On a more aggregated level, it is generally believed that the overall income-security system provides natural countercyclical effects on the economy. Some empirical estimates dispute this belief. We shall see that a possible reason for the ineffectiveness of social programs in this regard is the inappropriate timing of changes to the benefit structures.

Overall, the adequacy of a group of welfare programs must be judged by how well they help to reduce the hardship of those in need without undermining the efficiency of the economic system; i.e. without constraining the growth potential of the market economy. We shall try to gain some understanding of these effects in the next sections and discuss

the relevance of various proposed reforms. However, we shall first digress with some general considerations about redistributive measures which, in our view, have either been neglected in the current debate or can deepen our understanding of the issues to be discussed subsequently.

The rest of the paper is organized as follows: The third section focuses on the effects of public pension plans and the age-related programs in some detail. Sections 4 and 5 respectively discuss the effects of unemployment-related programs, and family and poverty-related programs. Section 6 analyses the combined effects of all income-security programs and their interrelations. Section 7 studies the reverse effect of economic conditions on the programs themselves. Finally, section 8 offers some conclusions.

2. GENERAL CONSIDERATIONS ABOUT REDISTRIBUTIVE MEASURES

We have already mentionned the importance of the equity-efficiency trade-off in assessing redistributive measures. Let us analyse in more detail what this concept involves. The tradeoff clearly depends on many factors. Examples are: actual distribution of market earnings, average and marginal tax rates of existing programs, behavioral responses and, especially, the particular policy used to affect the desired redistribution. (See, e.g., Browning and Johnson (1984)). Indeed, the trade-off is not unique; there is one associated with each policy. This implies that moving away from an unacceptable configuration of equity and efficiency does not necessarily imply the reduction of either component. An appropriate policy change may achieve a greater amount of efficiency along with a greater amount of equity.

Recently, Varian (1980) has argued that the optimal redistributive system not only depends on the equity effect of changing the distribution of income and the efficiency effect from reducing incentives, but also on an insurance effect which results from reducing the variance of individual income streams. The basic result of his analysis, which incorporates the insurance effect of redistribution, is that the optimal marginal tax on the highest observed income needn't be zero as the standard literature on equity-efficiency tradeoff argues. (See, for example, Brito and Oakland (1977), Phelps (1973), Sadka (1976) and Seade (1977)). That is, it may be optimal to have a positive marginal tax rate on the highest income even if this entails some negative incentives. The latter effects may be outweighted by the redistribution arising from the insurance aspect of the tax-transfer system. This would occur insofar as the redistributive system was fully perceived in advance so as to permit an ex-ante sharing of the risk associated with fluctuating income streams.

Here is how Varian justifies his result . First, recent work on the sources of income inequality has found that only a small fraction of

the variation in income can be explained by observed socio-economic characteristics (in particular those associated with economtives). Apart from possible deficiencies in the techniques used and unknown functional relationships between variables, three causes for such unexplained variations in income are: differences in taste, differences in unobserved endowments of native ability and, finally, differences in luck. Varian argues that the latter cause is probably the most important. (See also Jenck (1972)). This view is based on studies which show that there are wide variations in the economic status of individuals through time. For example, from a survey of 5 000 American families, Coe (1977) found that among the individuals who were poor in 1975 only 12 % were in poverty in each of the nine years between 1967 and 1975. Also 8.9 % of the population was poor in 1975 but fully one-quarter of the sample were in poverty in at least one of the nine years.[5]

Such a view offers a different perspective on policies towards income distribution and, in particular, on redistributive taxation. The motive for redistribution is not a desire for equity per se but a desire for social insurance. Given well-known arguments concerning moral hazard, adverse selection, transaction costs and returns to scale, complete private markets for this kind of insurance are not likely available. There is, therefore, a role for government intervention to improve the allocation of risk.

Under a simple model emphasizing the random character of income through time, Varian derives the optimal tax structure. In this framework, the optimal average tax is increasing with income and the marginal tax rate is positive and may increase with income depending on the nature of the stochastic influences on income. Indeed, the presumption is that the marginal tax rate on the highest income is likely to be quite large; "if the only way to become a millionaire is to be lucky, there should be very small incentive losses from taxing a million dollar income at a high rate - and there are substantial insurance gains since one can then subsidize million dollar occurences of bad luck". (Varian (1980), p. 63). In general, the progressiveness of the tax structure depends on the

degree of risk-aversion of the individuals in the society, increasing as risk-aversion increases.

Of course, income variations (even if only temporal variations for a single individual) are not due solely to the vagaries of fortune. Economic incentives surely play an important role. Policies directed towards redistribution must, therefore, involve both aspects of the problem; to provide adequate insurance against the effects of random events and to ensure a level of equity while impairing, as little as possible, the positive effects of economic incentives. If one could appropriately tag differences in income due to pure chance, the two problems could be separated; such is not likely to be the case.

However, just as it is not obvious that the optimal marginal tax rate on income derived solely form work effort should be zero (see Slemrod (1983)), it is not obvious that the marginal tax rate on income derived solely from luck should be large. The act itself of participating in a gamble may be the result of economic incentives (see Brenner (1983)) and may provide an impetus to foster growth (a point we shall analyse again in the context of unemployment insurance).

It should be clear from the discussion above that questions about the effects and optimality of various policies can only be addressed in a framework which reveals why a given situation is problematic and why there is need for corrective governmental policy. For example, consider the fact of unequal distribution of income. Is it an ethical problem solely based on considerations of fairness, or is it a problem because it reflects the absence of adequate insurance against adverse random fluctuations in income? For this problem, each context leads to quite different policy implications as the previous discussion makes clear.

These basic issues -- surrounding the nature of the need for government policies -- have not received enough attention in the debate surrounding their adequacy and their effects. We think that these problems are closely connected and will, therefore, take them into consideration when discussing the effects of various policies in subsequent sections.

3. THE EFFECTS OF AGE-RELATED PROGRAMS

Age-related programs include the following main items: Old Age Security (OAS), the Canada and Quebec Pension Plans (CPP/QPP), the Guaranteed Income Supplement and Spouses' Allowance (GIS) and various tax assistance schemes such as the Registered Retirement Savings Plan. This basic set of programs is supplemented by various types of provincial support.[6] All these programs are financed from general government tax receipts, except for the CPP/QPP plan which is financed (in part) by a payroll tax (1.8 % for both the employer and the employee in 1986). The old age security program guarantees a basic monthly payment to all individuals over 65 years of age. The GIS program supplements the revenues of poor elderly but is reduced if revenues other than the OAS are received (the provincial programs are similar except that they differ among provinces with respect to the level of additional benefits). The CPP/QPP plans are related to previous earnings records and the benefits are proportional, up to a maximum, to both contributions made earlier and the level of income in working years.

The main issues concerning public support for elderly individuals are: 1) the size of the benefits (and of the programs in general), 2) the role of the government in this domain, 3) the source of the contributions, 4) the treatment of women with respect to CPP/QPP plans and, especially, 5) whether the CPP/QPP plans should be financed on a fully-funded or pay-as-you-go basis. The main channel through which these issues are approached is the response of aggregate savings to an increased role for government unfunded provision of support in retirement age. The main argument against public retirement support is that it depresses personal savings.

It is, therefore, imperative to have an understanding both of the effect of public pension plans on savings and of the effects of savings on other macroeconomic variables such as investment, the capital stock and the growth of GNP. Before turning to the reasons why a government

retirement program may be needed, let us consider the role of savings in a life-cycle consumption framework and the effect of decreased savings on the growth of the economy.

- Savings and Growth

We begin with an analysis of the importance of savings with respect to growth and the level of consumption. Afterwards, the effects of social security on savings will be considered. The basic framework for analysing the effect of savings on growth is the standard neoclassical growth model due to Solow (1956), Diamond (1965) and others. A standard result of this literature is that the steady-state level of consumption is maximized when the rate of interest r, understood to be the social rate of return on investment, is equal to the growth rate of the economy $n + g$, where n is the growth rate of the labor force and g is the growth rate of real wages (or productivity). The steady-state level of consumption is the amount of consumption which could be sustained indefinitely given the existing level of savings in the economy. This configuration, with maximal sustainable consumption, is termed the Golden Rule.

Suppose the economy is experiencing a steady state along a Golden Rule path. If the presence of social security causes aggregate savings to decrease, then the interest rate will have a tendency to increase so that $r > n + g$. In this case, there is an underaccumulation of capital with a suboptimal level of the capital-labor ratio in the production process. This leads to a lower sustainable level of per capita consumption. While the transition to a steady state with a lower consumption path may allow the current generation to enjoy a greater level of consumption (because of the decrease in investment), this benefit must be weighted against the permanent welfare loss to all subsequent generations (see Boadway and Clark (1986) among others).

Of course, this analysis is one of full-employment in a closed economy with no market failures, etc., and may need to be qualified.

First, consider the case of a small open-economy with perfect capital markets which may be a good approximation to the Canadian situation. Here, the real rate of interest on investment is determined elsewhere. If domestic savings decrease, the tendency of the real rate of interest to increase causes foreign capital to enter the economy until the domestic rate is consistent with the world level. Thereore, decreased domestic savings have no effect on capital accumulation. If the exchange rate is flexible, the increased capital inflow will lead to an appreciation of the Canadian dollars and a decline in exports and an increase in imports. (See Pesando (1978), Kotlikoff (1979a), Mintz (1984)). The final effect of decreased domestic savings is, therefore, a change in the ownership of capital with no effect on capital accumulation per se.

Of course, actual international capital markets may not be perfect and the change in the ownership of capital may have long-term adverse implications or may simply be resented locally. So it is instructive to determine if, indeed, social security provisions do reduce savings.

Savings in a Life Cycle Framework

The standard framework for analysing the impact of public pension plans on aggregate personal savings was presented in Feldstein (1974). His analysis is based on the life-cycle theory of consumption originally proposed by Modigliani and Brumberg (1954) (see the excellent discussion in Modigliani (1986)). Each individual is portrayed as maximizing the discounted sum of lifetime's utility of consumption, subject to the budget constraint that the present value of future income streams equals the present value of future consumption. The age of death is assumed fixed and known with certainty. There is a date at which individuals retire, after which there is no flow of income and the individuals must live on the proceeds of previous savings (i.e. a combination of current interest yields with a portion of the capital accumulated). Without social security, the budget constraint imposes that the present value of

the stream of consumption over the entire lifetime be equal to the lifetime wealth, defined as the present value of earnings over the working period. With a social security system yielding benefits in retirement and taxing earnings in working-years, the lifetime wealth is the present value of the flow of after-tax income in the working age plus the present value of the flow of benefits in retirement.[6]

If the age of retirement is not affected by the presence of social security and the latter offers an implicit yield on paid-in taxes equal to the market rate of interest r, then lifetime wealth is identical in both situations (see the excellent discussion in Kotlikoff (1979a)). The assumption that the yield on taxes paid equals the market interest rate, requires that the present value of lifetime taxes paid must equal the present value of lifetime benefits received. In other words, with a population and productivity growing at constant rates n and g, this condition requires that $r = n + g$, i.e that the economy is at the so-called Golden rule level. If lifetime wealth is unaffected, the consumption path is the same and social security contributions simply replace one-for-one individual savings that would have been made without the system. This one-for-one reduction in savings is called the "replacement effect".

If the present value of benefits exceeds the present value of contributions ($n + g > r$), then lifetime wealth is increased and savings, for all ages, decreased. If $r > n + g$, lifetime wealth is decreased and savings increased. This phenomenon is called the "yield effect".

A third feature is the "retirement effect". If the retirement age is reduced because of the incentive provided by the flow of benefits from a given age onwards, then lifetime wealth is reduced as the income stream is shortened. Therefore, the consumption stream decreases and savings increase at all ages.

The sum of the replacement and yield effects are unambiguous if the real rate of return on investment is less than the rate of growth of

the economy (i.e. $r < n + g$) and reduce aggregate personal savings. On the other hand, if the real rate of return on investment is greater than the rate of growth of the economy (i.e. $r > n + g$), the sum of these effects will induce an increase in aggregate savings only if the yield effect is sufficiently positive to outweigh the replacement effect. Therefore the overall effect of social security on aggregate personal savings is ambiguous. The retirement effect has an unambiguous positive effect on savings. Although it remains an empirical matter to determine the overall direction, the presumption of many is that aggregate personal savings are significantly decreased.

If the program is financed on a fully-funded basis and if the real rate of return on investment is equal to the rate of growth of the economy (i.e. $r = n + g$), then the replacement and yield effects are null and aggregate savings are unchanged, unless the retirement effect is operative and savings may actually increase.

This simple model, although quite useful, has some shortcomings which may in fact undermine the importance of other effects in the determination of aggregate savings. Several shall be considered.

First, the model treats the role of savings solely as a source of income for retirement. In fact, savings have a potentially large role as insurance or a "safety net" in case of decreased income in some years. Savings may thus be directed by precautionary motives. A pay-as-you-go social security system, in effect, locks in savings for retirement so that they cannot be used for any other purposes. In this sense, the precautionary motive has a positive impact on personal savings.

Secondly, if capital markets are imperfect and individuals are constrained and cannot borrow against future social security benefits, the optimal consumption level may decrease in some years and total lifetime savings will increase as a result. (See Kotlikoff (1979a) and Kotlikoff, Spivak and Summers (1982)). As was shown by Hubbard (1985), social security financed by a payroll tax may tighten the constraints on

consumption by lowering current net earnings at the same time that borrowing against future earnings is severely limited. Social security may reduce savings when life expectency is uncertain, but the presence of capital market constraints may actually reverse this effect.

Thirdly, the model is a partial equilibrium analysis which does not recognize the shift in earnings and the optimal consumption profile which arise from changes in the steady-state capital stock and in the age of retirement (see Kotlikoff (1979a)). A reduction in the steady-state capital level, caused by a decrease in savings, may increase or decrease wage earnings and interest rates, as the induced retirements diminish the effective labor force. The most likely case is a fall in wages and a rise in the interest rate and, in this case, both the earnings and optimal consumption profile decrease; the effect on savings and hence the capital stock is indeterminate. Kotlikoff (1979a), using a theoretical overlapping-generations model, found that the general equilibrium effect still implied a reduction in the capital stock but of much smaller magnitude than was predicted by the partial equilibrium model.

Fourthly, the view presented above, assigns to the government a monopoly position with respect to intergenerational transfers. Barro (1974, 1978) has noted that individuals have numerous private opportunities to shift income across generations. Voluntary contributions from parents to children may include educational investments and bequests; on the other hand, chilren may provide support for parents in old age. Viewing social security as government-imposed intergenerational transfers, Barro argued that individuals would shift private transfers by an amount sufficient to restore the same balance of income across generations that would be chosen in the absence of social security. Among these effects, the most important is likely to be the reduction in the support of the young towards the elderly. Therefore, with an operative bequest motive the prediction is that social security would not affect total private savings. Barro's analysis has been extended by Sheshinski and Weiss (1981) to the case of an uncertain length of life. Examining the annuity aspect of social security within the framework of

an overlapping-generations model with the possibility of bequests, they showed that the steady-state path of the economy is the same whether social security is financed on a fully-funded or pay-as-you-go basis as long as the chosen level of benefits and contributions is optimal. The optimality criterion refers to the annuity concept of social security and is determined as the stream of annuities a representative individual would choose if forced to pay for it. More precisely, consumption, aggregate savings and individual utility are the same in both systems, and the sum of private savings and social security contributions under a fully-funded system is equal to private savings under a pay-as-you-go system. Of course, these results may not hold if there are constraints on bequests, such as would be the case if individuals choose a solution of zero bequest and there would be no mechanism to enforce negative bequests.

Hu (1986) considered a similar analysis in which there is no market failure in the provision of annuities. He obtains, in particular, the result that increases in social security taxes crowds out pension savings by the exact amount of the taxes while leaving nonpension savings unchanged, if the rate of return on social security is equal to some "hurdle" rate. If the rate of return is greater than the "hurdle" rate, total personal saving is then reduced by more than the tax increase and vice-versa. This "hurdle" rate depends on the rate of return to nonpension savings and the insurance premium that the individual is willing to pay for pensions so as to reduce the uncertainty in retirement consumption that arises from an uncertain life span.

Finally, the main shortcoming of the above analyses of the effect of social security on aggregate savings is that it does not consider why we actually need a government system to implement such transfers. Why is it that we cannot rely solely on private market forces to obtain an efficient allocation of resources among generations? Though a few critics have suggested the complete phasing out of social security (see, eg., Friedman (1972) and Ferrara (1982)), most observers admit that the government has a crucial role to play. However, the reasons advanced to

justify this role vary. Among the most cited are possible gains resulting from: 1) reducing uncertainty, 2) reducing transaction costs, 3) redistributing lifetime income, 4) protecting the imprudent and 5) compensating for myopia (Thompson (1983)). An understanding of which is the most adequate explanation will deepen the analysis of the effects of social security on aggregate savings.

Why is there a Need for Government Intervention?

a) Income Redistribution

An argument often advanced is that social security provides a means to redistribute income. Since the annual income tax and estate taxes do not yield ideal redistribution results, there is room for an additional device (Diamond (1977)). The advantage of social security is that it is the only program which redistributes income on a basis more closely related to permanent income (or more simply the average income over the working period). A second redistributative function is between generations. Indeed, if the present value of benefits exceeds the present value of contributions (associated with a small trust fund), there is a transfer from succeeding generations to previous ones. This transfer mainly occurs at the start of the program and may have been justified in the case of the U.S., since those benefiting had experienced the Great Depression, but not in the Canadian case since the program was initiated in an era of prosperity.

The redistribution argument may be well justified. However, it can account for at most the GIS portion and not the OAS and CPP/QPP programs, since these are not in any sense redistributive (except insofar as the CPP/QPP redistributes resources at the outset of the program before it reaches maturity; in this case there is intergenerational redistribution).

b) Market Failure

Three types of market failures have been advanced to explain why the private market cannot provide instruments which enable individuals to prepare adequately for retirement: the absence of safe investment opportunities (in real terms), the absence of real annuities, and the problem of risk associated with a varying length of working life (Diamond (1977)). These failures imply that there are no private investment mechanisms, especially for small investors unable to diversify their portfolio, which give a reasonable yield and a safe real rate of return. Pesando (1984) argues that a fully-indexed annuity would give a rate of return less than 1 % in Canada and around 0 % in the United States. Indeed, a fully-indexed annuity would provide a lower rate of return than the minimum variance portfolio composed almost exclusively of treasury bills. The latter have a long-term real return between 0 and 1 %. Nevertheless, real annuities cannot be purchased in Canada or the United States.

If these were the only reasons for a social security program, the government could handle the problem by issuing indexed bonds. However, the problem of risk associated with a varying length of working life creates a moral hazard problem in the sense that individuals' actions have an effect on the actual age of retirement. For example, if an individual held on indexed bond paying a stream of income after retirement he/she may not take as much care of his/her health knowing that after a forced retirement the stream of income is available. Here, the structure concerning the link between benefits and past earnings as well as the age of retirement would be a major part of the optimal design, and social security, as it exists, would be a natural social tool to deal with this problem.

According to this reason for government intervention, the replacement effect of a pay-as-you-go social security would be much less than the one-for-one effect discussed earlier, because government intervention leads to a more efficient means to provide funds for retirement. This justificaton, however, does not explain why the program should be financed on a pay-as-you-go or on a fully-funded basis.

c) Paternalism

The most popular explanation for government intervention is that individuals would not save enough if left to their own devices (Diamond (1977), Feldstein (1977), Kotlikoff, Spivak and Summers (1982), Hamilton and Whalley (1984)). For some reason or other, the government should intervene to correct these private decisions in order to increase the level of welfare for each individual. Indeed, the empirical evidence presented in Diamond (1977), Kotlikoff, Spivak and Summers (1982) and Hamilton and Whalley (1984), among others, suggests that a substantial fraction of the population does not save enough for retirement and relies solely on public provision for its old-age consumption.

There are many factors which could influence individuals to save too little. First, there are difficulties in planning under uncertainty, especially since planning for retirement involves long lags between actions and consequences. There are, as well, a large number of uncertainties which involve low probability events. Under such circumstances, the role of the government is to increase efficiency in decision-making. This may lead to substantial increases in welfare, especially in light of the fact that the consequences of poor planning for retirement are extreme.

A second factor is that there are substantial costs in gathering all the relevant information to plan for retirement, especially for the less financially sophisticated. Because of the danger of adverse selection, the private sector could not provide a mechanism to reduce the overall information cost; so the government must intervene.

A third factor may simply be that individuals would "irrationaly" choose to save too little. There may still then be a case for government intervention to correct this "irrationality".

It is possible to analyse the effects of a pay-as-you-go social security system in this context. It is instructive, also, to analyse the

effects with or without perfect capital markets. (See Kotlikoff, Spivak and Summers (1982)). First, consider the case of perfect capital market. Denote as myopic, an individual described by either of the first two factors listed above (i.e., an individual who may want to save for his retirement but is constrained in his decision process), and denote as non-myopic an individual, not constrained by these factors, who would voluntarily choose not to save much for retirement. With non-myopic, unconstrained individuals, government interference in the savings decision would be counteracted by the individuals themselves. In the presence of perfect capital markets, non-myopic individuals would borrow against future social security benefits to restore their consumption plan to the pre-contribution level. In this case, pay-as-you-go social security effectively depresses private savings. Myopic savers, however, would not reduce their savings. On the one hand, they may view contributions as an appropriate savings plan which they could not have fashioned themselves due to uncertainty and transaction costs. Therefore, they would reduce their consumption level by the size of their contributions, period by period. On the other hand, they may not foresee future social security benefits. In this case the effects are the same, since contributions are viewed as a tax on earned income.

If capital markets are not perfect and individuals cannot borrow on future benefits, social security may decrease the consumption path of non-myopic individuals and, as a result, not affect private savings. The effects on myopic savers is the same whether capital markets are perfect or not, since by definition they do not foresee or think about future benefits. Hence, they will never attempt to borrow against these future income streams.

Therefore, a pay-as-you-go social security system wil have a negative impact on aggregate savings only insofar as it affects non-myopic, unconstrained (by capital market conditions) savers.

These considerations do not imply that the social security scheme should be funded on a pay-as-you-go basis rather than on a fully-funded

basis. If the plan were fully funded, aggregate savings would increase in all cases except with non-myopic unconstrained savers in which case there would be no change.

If the goal is to maximize the benefits to the elderly, given a contribution rate levied on the working generations, the relevant choice between a pay-as-you-go system and a fully-funded one would depend on the relation between the growth of GNP and the rate of return on investment, r. Consider the real growth rate of GNP as the sum of the growth rate of the labor force, n, and the growth rate of real wages (or productivity), g. Then a pay-as-you-go pension system would yield higher benefits, (for given contributions) if $n + g > r$. Otherwise, a fully-funded system would yield higher benefits. If the economy is on an optimal steady-state path, then $r = n + g$ and the two methods yield the same benefits. (See Aaron (1965), Boadway and Clark (1986); Faille, Lévesque and Rousseau (1977) among others). The presumption is that currently $r > n + g$, where r is understood as the social return to investment. If this is the case, it is arguable that social security should be introduced on a fully- funded basis to increase both the capital stock and long-run welfare.

But these considerations are far from being the only ones justifying the presence of social security. Other factors may exist which would justify a pay-as-you-go system even if the real rate of return on investment is greater than the rate of growth of the economy. We now turn to broader economic arguments for a pay-as-you-go social security system.

- Social Security as Insurance against Demographic Changes

Smith (1982) and Green (1977) argued that an unfunded social security scheme, with a fixed level of payments to the retired, offers insurance against the risks of income variation caused by demographic changes. The model used to analyse this question is the Samuelson-Diamond overlapping-generations model with production, with the added

complexity that the rate of population growth may not be constant. The key point in the model is that demographic changes affect both wages and returns to private savings. Consider an economy on a dynamically efficient path in which r = g + n; i.e. we consider an economy on a Golden Rule trajectory, so that the unfundedness of the program does not cause suboptimal capital accumulation. It is clear that along an optimal path the rate of return on savings, r, decreases as the size of the working force decreases (from the simple facts of diminishing returns). On the other hand, if the work force is relatively small, a relatively high wage will be earned (because of the principle of diminishing marginal productivity with increased production).

In this context, a fixed-benefit unfunded social security program provides insurance against the contingency of being born into a large generation. If an individual is in a generation which is large, pretaxed real wages are lower; however, with a fixed benefit payment to retired individuals, the per capita contributions of the workers are smaller. Conversely, if an individual is born in a small cohort, pre-tax real wages are higher, but the per capita benefit increases because of the previous larger cohort. The poorest generations are those which are large relative both to the preceeding and succeeding generations. In this case, they will have both smaller real wages and real returns. Smith (1982), p.105 concludes that:

> "[...] The model shows that a social security system with benefit payments which are fixed and tax payments which are contingent on demographic change, provides social insurance against the risk of being born into an unusually large generation. This should be borne in mind in the evaluation of proposals to reduce the real value of social security payments because demographic change has made them too costly."

Green (1977) concludes, however, that the offsetting movements in required payroll tax rates would not be enough to argue that this phenomenon alone could justify the current system of social security.[8]

Social Security as Intergenerational Risk-Sharing

Enders and Lapan (1982) and Watson (1982) have examined the role of social security as providing intergenerational risk-sharing with respect to technological uncertainty (arising from a stochastic productive function). With this kind of uncertainty about output, the overall price level and the real value of one's savings for retirement are also uncertain. In this case, social security acts as a means to pool risk across generations; given that individuals are risk-averse, such a scheme will increase their utility. For example, social security may act as insurance against events such as the Great Depression. Such drastic events can wipe out individual savings through bankruptcy and other factors. Social security would, in this case, redistribute income from the younger cohort who did not work during the depression to the older affected by it. It is, in effect, a transfer from the lucky to the unlucky. Such an analysis recalls Varian's introduction of the insurance effect (see Section 2), now applied to intergenerational transfers instead of transfers within a generation.

In another context, Watson (1982) considers the effect of uncertainty on the level of future benefits themselves and, in particular, the uncertainty arising from the transfer aspect of benefits. For example, if there is uncertainty about future payments, due to the fact that a small cohort of workers will be supporting a larger group, there could be a fear that the level of benefits might be decreased. This fear may lead to increased savings on the part of individuals.

It may be realistic to consider social security as an intergenerational transfer of risk. Indeed, the timing of the introduction of social security in the United States, just after the Great Depression, suggests that these factors may have had some relevance for its implementation (see Aaron (1984)).

- Social Security as a Return on Investment in Human Capital

Pogue and Sgontz (1977) have argued that investment in human capital and the welfare of both the younger and older generations may be greater with an income transfer system than with a fully-funded one. Suppose that the social rate of return on investment in human capital is greater than the social rate of return of physical capital.[9] In this case, there is an incentive for parents and children to reach an agreement under which parents invest more in their children in exchange for an income transfer in their retirement years.

Though such contracts have previously existed at a private level, it may be more efficient to establish them through public arrangements for the following reasons: 1) private contracts may not be legally enforceable; 2) although the private rates of return on human capital and physical capital may be equal, there may be externalities which change the social rates of return and which can't be captured by a private system of contracts between parents and children; 3) private mechanisms may not allow childless adults to invest in the human capital of the next generation; 4) some parents may not be able to invest enough in their children; and 5) a collective mechanism may provide a means by which both parent and child can pool risk.

One mechanism to achieve an adequate investment in human capital and to attain the available welfare gains would be a system of publicly-financed education combined with an income transfer system for retirement such as social security.

> "Stated differently, an [income transfer] mechanism for providing income during retirement years, can be viewed as a means of allowing the working population to acquire an annuity. The income is based on relatively high yielding investment in human capital rather than the relatively low yielding investments on physical capital that constitute present insurance company portfolios. As a result, both parent and child generations can be better off." (Pogue and Sgontz (1977), p. 161).

On this view, increased expenses on education would be associated with increased public provisions for retirement. Pogue and Sgontz find that the data suggest such a correlation. This view of the role of social security also undermines empirical findings in the literature which discusses the effects of social security on private savings. Indeed, the data in the national income accounts include expenditures on human capital formation as consumption. In this case, an increased current consumption, associated with increased social security benefits, may be attributable to increases in human capital formation.

An implication of this analysis is that the conversion from a pay-as-you-go system to a fully-funded one (invested in physical or financial capital) does not necessarily imply an increase in aggregate savings. Furthermore, the welfare gains could be larger if the retirement program was financed from general tax revenue than from a payroll tax.

- Social Security as a Means for Efficient Risk Sharing when Human Capital is not Tradable

Merton (1983) argued that the nontradability of human capital leads to a market imperfection which could be corrected via a mechanism which closely resembles a pay-as-you-go social security system. The analysis stems from optimal financial portfolio considerations. As is well known in the finance literature, an optimal investment strategy invests a fraction of personal assets in a well-diversified portfolio of all available risky assets and the balance in the riskless asset, the proportion depending on the total desired risk of the portfolio. However, if human capital is nontradable, then neither the young nor the old will be able to achieve their optimal portfolio position unless the return on human and physical capital are perfectly correlated. In such a case, the path of consumption is suboptimal and hence inefficient.

The nontradability of human capital forces the young to hold too much of it relative to physical capital and the elderly to hold too

little. This portfolio imbalance can be corrected by an appropriate system of taxes and transfers. A wage tax takes some human capital from the young and, because the retirement benefits are a function of current wage earnings, a transfer of these benefits to retired individuals allows them to hold more human capital. To achieve a transfer of physical capital from the old to the young, consider a consumption tax. Since the old consume a larger fraction of their wealth, the consumption tax proportionally takes more away from older people. This transfer to children permits them to finance current consumption and investment in human capital.

In a sense, this interpretation complements the analysis of Pogue and Sgontz. The end result, however, is slightly different because it features a retirement system financed on wages rather than total income. However, the analysis still implies a pay-as-you-go system, as Merton (1983, p. 352) argues:

> "[...] a latent function served (at least in part) by the present pay-as-you-go social security system is that of [improving] the efficiency of risk bearing in the economy when human capital is not tradable. Indeed, the returns from a fully-funded system which invests its contributions in traded securities cannot possibly replicate the returns from investing in a non-traded asset except in the singular case where a traded security exists and whose returns are perfectly correlated with those of the non-traded asset. Hence, any system which attempts to replicate the returns from such a non-traded asset must at least appear to be a pay-as-you-go system."

- Public pensions as optimal social contracts

Renctly, Veal (1986) analysed public pensions as being a form of optimal social contract between individuals of different generations.

The argument is crucially dependant upon the postulate that the young receive a positive externality (in terms of utility) with respect to the elderly's consumption. In this case individuals are likely to "rationally" undersave for retirement because they can expect to rely on gifts from the young for retirement, for example by a form of public assistance. Social security is then a means of forced-saving.

Two reasons are advanced to justify that the proper form of the forced-saving system would be a pay-as-you-go plan instead of a fully-funded plan. First the funded plan does not generate the benefits of increased consumption by the old generation at the start of the program. Secondly the funded plan is always vulnerable because the current young generation could stop contributing, rely on the next generation for retirement assistance and still enjoy the current consumption externality from the savings of its parents. A pay-as-you-go system is not vulnerable in this way. The incentive for the current young to reduce payment to the elderly is offset by the loss of consumption externalities from the old and by the fact that the individuals realise that they too would receive reduced payments when old. In this context, the pay-as-you-go pension system is part of a social contract which binds all future generations to respect it.

The model can also explain in an interesting way some aspect of the "Bankruptcy law" and why individuals cannot borrow, when young, against future retirement earnings. The bankruptcy law entitles an individual to enough of their asset to maintain some minimum standard of living. This aspect is well explained by the consumption externality described above. Furthermore this same phenomenon explains why one cannot borrow from retirement earnings. It is indeed rational in this context to forbide an individual to risk too much of their retirement income because the next young generation would have to provide for retirement assistance due to the consumption externality.

Some Implications

There are surely other examples which would give a positive role to a pay-as-you-go social security system. However, the ones analysed above are sufficient to stress that the move from an unfunded system to a fully-funded one does not only involve a change in the magnitude of personal savings. Such a move would have wide macroeconomic implications; for investment in human capital, the efficiency of portfolio decisions, the sharing of risk, all of which have definite impacts on the sustainable level of the capital stock and the production of real goods and services.

Nevertheless, if the presence of social security would indeed imply a significant reduction in aggregate savings (inclusive of those channelled through human capital formation), its benefits might be outweighed by the cost of lower capital stock and the ensuing reduction in sustainable levels of consumption. It is, therefore, instructive to look at the empirical findings on the effects of social security on savings.

- Empirical Estimates of the Effect of Social Security on Savings

There exists a quite extensive and varied literature concerning the empirical evidence of the effects of social security on aggregate savings. This interest was fueled by the studies of Katona (1964) and Cagan (1965) who found that social security actually increased private savings (using a cross-sectional sample). The explanation put forward was that social security created an awareness of the importance of saving for retirement and actually helped individuals afford it. These results were skeptically received and it is actually the work of Feldstein which ignited a lengthy debate. We shall not review in detail all the elements which have characterized this debate but only outline the major findings and controversies.

a) Time Series Analysis

Feldstein (1974) first used time series techniques to analyse the effects of social security on private savings. The major element of the analysis was the construction of a time series of a "social security wealth" variable which would represent the present value of the anticipated retirement benefits for all individuals. When this series was related to consumer expenditures (taking into account disposable income, retained earnings and per capita household wealth), the results indicated that each dollar of gross social security wealth (gross of the present value of contributions) decreases savings by $0.024. This implied a reduction in aggregate savings by a half; the cumulative effect was a reduction by 38 % of the capital stock of the United States below what it would have been in the absence of social security.

The major criticism of Feldstein's findings came with the work of Leimer and Lesnoy (1982) who showed that this result was due to a programming error in the calculation of the social security wealth variable. Once this was corrected, the implied effects on private savings were still negative but of a considerably lower order of magnitude and, in fact, statistically insignificant. They also showed that the results were not robust to changes in model specifications. For example, taking account of the effects of unemployment and changes in retirement age, Munnell's (1974) findings were negative but of a much smaller magnitude. Leimer and Lesnoy also showed that one could almost get any result one would desire by considering alternative specifications of the formation of expectations in the construction of the social security wealth variable. Furthermore, Feldstein's results were only significant if the entire 1929-71 period (ommitting the war years 1941-46) was analysed, a period which included the troubled years of the Great Depression.

Others have criticized Feldstein's methodology. Darby (1979) argued that the use of gross instead of net social security wealth overstates the reduction in savings by 15 %. Leimer and Lesnoy (1982)

replicated Feldstein's analysis with the corrected wealth variable and found that, using the net wealth variable, social security had a significant positive impact on aggregate savings. Kotlikoff (1979a) noted that the Feldstein estimates are partial equilibrium results which do not allow the implied decrease in savings to affect the rate of return on capital. Through some simulations he finds that the decline in savings is reduced to 20 %. In a recent paper, Beach, Boadway and Gibbons (1984) extended Feldstein's analysis to incorporate the endogeneity of wealth and income in relation to social security. Feldstein's strong effects were considerably weakened under this specification.

Other time series studies include Barro (1978) who found negative but insignificant effects for some specifications and no discernible effects for others. Boskin-Robinson (1980) and Feldstein (1977, 1978 and 1982) found some negative impacts; Barro and MacDonald (1979) in a multi-country study found no significant impact. (See also Koskela and Viren (1983)). For the United Kingdom, Browning (1982) found significant but small effects, and also questioned the ability of people to project their social security benefits accurately. He also noted that the estimates cannot differentiate between wealth effects and distributional effects.

In the Canadian context, Pesando and Rea (1977) found that their version of a constructed social security wealth variable had a consistently negative impact on consumption and found no evidence that CPP/QPP has depressed savings. Following the Feldstein methodology, Boyle and Murray (1979) found that neither the OAS nor the CPP has a significant impact on aggregate savings. These results are confirmed in a study by Wrage (1980). No study is yet available on the impact of tax exemptions associated with the Registered Retirement Savings Plan. An a priori view suggests a positive impact on savings.

Finally, Williamson and Jones (1983) cast serious doubts on the basic ability of time series analysis to assess the impact of social security on aggregate savings. Basically, they argued that the simple

life-cycle model is ill-suited to such purposes. Indeed, demographic factors interact with changes in social security to determine the coefficients of the consumption function, so that the coefficient of the social security wealth measure cannot isolate the impact of social security. In particular, the results obtained may crucially depend upon the number of years the changes have been implemented. These explanations may account for the contradictory results obtained in the literature.

b) Household Cross-Sectional Studies

The advantage of cross-sectional studies is that they also allow tests of the basic framework of the life-cycle theory of consumption. On this account, the fundamental finding is that households may have a humped-shape wealth profile through life, but that the decline of wealth in retirement is much less than predicted by the life-cycle theory (even if one accounts for an uncertain lifetime). This result suggests a bequest motive in the determination of life-time savings (see King and Dicks- Mireaux (1982), using Canadian data; Diamond and Hausman (1984) and Hubbard (1986)).

As far as the effects of social security wealth on private savings are concerned, the first study was made by Kotlikoff (1979) who found a 70-cent reduction in asset levels per dollar of present value of accumulated tax. However, his results are not precise (highly variable) and do not say much about the downward effects on private savings; they simply suggest that forced savings are a partial substitute for private savings. Feldstein and Pellechio (1979) estimated the effects of social security on private wealth accumulation just prior to retirement. They find that social security wealth is close to a perfect substitute for private wealth. On the other hand, Diamond and Hausman (1984) found a significantly less than dollar-for-dollar savings offset. (See also Hubbard (1986)).

Using Canadian data, Dicks-Mireaux and King (1984) found an average offset to private wealth of about 30 cents for each dollar of social security wealth. The no-displacement effect, however, is included in the range of possible posterior outcomes. Daly (1982, 1983) analysed the effect of social security on the level of Registered Retirement Savings Plan and found that they were partial substitutes. However, as noted (1983, p. 68), "The results [...] could be consistent with those of Boyle and Murray if the response of non-registered savings to the Canada Pension Plan offset the adverse effect on RRSP savings."

As previously noted, private savings could be reduced and have no effect on investment and the capital stock in an open economy, since foreign capital could be substituted if international capital markets were efficient. No empirical test of this hypothesis has been performed.

Finally, we may note the recent attempt by David and Menchik (1986) at directly evaluating Barro's hypothesis that bequests are affected by changes in the social security program. Recall that according to Barro, social security would not affect total private savings. Given a lifetime wealth increment caused by a governmental imposed intergenerational transfer, individuals would respond by augmenting their savings for a larger bequest so as to restore the original intergenerational distribution. David and Menchik used a sample of 720 Wisconsin males born between 1890 and 1899 with lifetime earnings records obtained from income tax returns and bequests obtained from probate court records. They calculated a lifetime wealth increment variable representing the benefits exceeding the value of the individuals' contributions. If the bequest motive is operational, increases in this variable should be exactly offset by the displacement of a private transfer. This should occur because parents, according to Barro, see this lifetime wealth increment as a liability on their children. The results they obtained are first that these men did not save less in anticipation of their benefits (perhaps because of the high degree of uncertainty they placed upon receiving them). They found no

effect of social security wealth on the age-wealth profile, a finding at odds with the life-cycle hypothesis. Secondly, once these benefits were materialized after retirement, they were spent and not bequeathed to future generations, a finding at odds with Barro's hypothesis. Overall, social security did not affect the savings behavior of these individuals, it only increased the level of consumption after retirement.

Concluding Comments on the Impact of Social Security on Aggregate Saving

Overall, the empirical estimates are certainly inconclusive. Indeed, Aaron (1983, p. 51) concludes that the literature has "produced a series of studies that can selectively be cited by the true believers of conflicting hunches or by people with political agendas that they seek to advance". Danziger, Haveman and Plotnick (1981, p. 1006) argued that total income transfer programs in the United States "[...] have depressed annual private savings by 0-20 percent relative to their value without these programs, with the most likely estimate lying near the lower end of this range".

. Considering the fact that private savings are only a part of total national savings, the presumption is that social security may not have a very important role in explaining a potentially suboptimal level of the capital stock. Let us quote Aaron (1982, p. 52) on his conclusions concerning the policy implications:

> "I conclude that the evidence does not support the position that reductions in social security benefits would be effective in increasing private saving. I also conclude that if we wish to increase capital formation, the proper objective is the total saving rate, and that raising social security payroll taxes or cutting social security benefits is a poor device for achieving that objective unless we favor them on other grounds. We should make social security policy on the basis of considerations other than its supposed effects on saving".

Thompson (1983) advanced the same conclusions and indeed argued that reducing social security is by no means the most effective way to increase total savings. An obvious alternative concerns the size of the government deficit itself, inclusive of potential deficits caused by a pension program; "Any other method of increasing the unified budget surplus will have the same effect on saving as the accumulation of social security reserves". (Thompson (1983), pp. 1444-1445). In the Canadian context, Asimakopulos (1984) has also argued that social security should be analysed in the broader context of total budget deficits.

While the empirical findings are mixed with respect to the effect of social security upon aggregate savings, barely no studies have been pursued to analyse the various theories explaining the optimality of a pay-as-you-go system, as they were outlined above. Indeed most of the empirical discussion has tried to evalute whether the real return to investment is greater than the rate of growth of economy (see e.g. Abel, Mankiw, Summers and Zeckhauser (1986)). But, as noted above, this issue is only a part of the relevant picture, various other theories suggest the optimality of a pay-as-you-go system even if the real rate of return on investment is greater or equal to the rate of growth of the economy. Clearly more empirical studies are needed to assess the empirical relevance of the following (and other) approaches: a) social security as insurance against demographic changes; b) social security as intergenerational risk-sharing; c) social security as a return on investment in human capital and d) social security as a means for efficient risk-sharing when human capital is not tradable. These various theories not only shed light on the optimality of a pay-as-you-go system but in some instances also on the appropriate method of financing.

Upon this review of the various reasons suggesting why a pay-as-you-go pension system may increase economic efficiency and increase total saving, we conclude that the income-transfer system for the elderly should not be transformed into a fully-funded scheme. There may also be good arguments to support the financing of CPP/QPP on the same basis as OAS and GIS; i.e. from a payroll tax to a general income or

consumption tax. This could potentially help provide adequate pensions to elderly women by undermining the myth that pensions are solely a means to smooth the income-stream derived from work-related earnings in working years. There are many factors arguing in favor of the popular notion that income-transfers to the elderly should be more or less universal, a due for previous contributions to society (see National Council on Welfare (1982), for example).

4. THE EFFECTS OF UNEMPLOYMENT-RELATED PROGRAMS

There are four programs related to employment or the lack of it: Unemployment Insurance ($11.6 billion), Training Allowance ($0.2 billion), Workers' Compensation ($1.6 billion), Employment Expense Deduction ($1.2 billion). The Unemployment Insurance program is by far the most important one; the others are marginal.

The main criticisms of the Unemployment Insurance program have focused on its negative work incentives. Indeed, the presence of U.I. lowers the opportunity cost of not working and may induce the prolongation of the unemployment period (although it could also potentially have a positive effect on employment due to the required number of weeks worked to be eligible as recipient). The U.I. program has also other effects on aggregate variables, and not solely in direct relation to its effects on labor supply. Examples include effects on aggregate consumption, savings, the price level, the demand for labor, economic stability and the growth of the economy. We shall consider briefly some of these effects in this section.

The major goal of most social insurance programs is the maintenance of consumption (e.g. Hamermesh (1982)). The way the Unemployment Insurance system originally intended to fulfill this objective was through a program of insurance against events believed to be outside individual control. It has been argued, however, that the program has often deviated from these insurance foundations to meet other objectives such as horizontal, vertical and interregional redistribution (see Cousineau (1986b)). The effects of Unemployment Insurance can be assessed by analysing how it fulfils the various objectives for which it is intended.

Consider, more generally, Unemployment Insurance as a device which helps maintain individual consumption levels in the face of adversity. How well the Unemployment Insurance program achieves this

goal is determined, to a large extent, by its effects on total consumption and the pattern of consumption. If Unemployment Insurance, in fact, achieved this goal of consumption maintenance, we should observe the following behavior: 1) equal rates of consumption even in periods of unemployment; 2) equal average propensity to spend on different commodities among UI recipients and others; 3) equal marginal propensities to spend on each commodity out of UI benefits and other income (by non recipients). Note that this does not presuppose that the Unemployment Insurance benefits must be equal to the income earned before the unemployment period. There may be savings available to the unemployed and there is always the possibility of borrowing against future income. To the extent that there may be imperfections in the capital market, the unemployed individual is constrained in his consumption behavior. This would imply "too little" consumption in the unemployed period and "too much" consumption in the rest of lifetime relative to the optimal path. This pattern would imply a decrease in the overall level of utility, if there is decreasing marginal utility of consumption in each period. In this regard the Unemployment Insurance program can be seen as alleviating capital market imperfections to restore the optimal path of consumption.

Hamermesh (1982) estimated that approximately 60 % of Unemployment Insurance recipients behave as if their borrowing is constrained; i.e. this shows that they are unable to borrow to maintain their optimal consumption path. On the other hand, 40 % behave as if they were unconstrained, a fact which suggests that Unemployment Insurance benefits are spent like any other income and may not be needed to maintain consumption. Hamermesh also shows that the 60 % of individuals who face constraints in their level of consumption also face constraints in the composition of consumption (by reducing spending on income-elastic goods). For these Unemployment Insurance recipients, additional benefits ease the constraints both on the level of consumption and its composition.

These findings have definite implications for the potential macroeconomic stabilization effects of the Unemployment Insurance

programs. In effect, a large fraction of recipients, approximately 40 %, view Unemployment Insurance benefits as an increase in permanent income and consume them as if they were fully expected. The transitory increases in income then become part of permanent wealth and are consumed over the rest of the lifetime. As Hamermesh (1982, p. 112) concludes: "Much of the potential macro-stabilizing effect of Unemployment Insurance is thus dissipated because many recipients respond to the existence of Unemployment Insurance payments by changing saving rather than consumption spending". For these individuals consumption would not fall substantially if benefits were lower. Nevertheless, there remains a substantial fraction of recipients for whom unemployment benefits alleviate the constraints on consumption patterns.

The extent to which the Unemployment Insurance program is a natural macroeconomic stabilizer depends on the way it affects total consumption. From the above discussion it does not completely achieve this function because Unemployment Insurance benefits are not fully consumed. The Unemployment Insurance program, however, has other effects which are related primarily to its performance as an insurance program per se.

The Unemployment Insurance program was originally intended to be a program more or less based on insurance principles. The adverse selection motive evident in this context implied that the program should be governmental. As an insurance program it should, in principle, cover unforeseen events that are out of the direct control of the individual insured. To the extent that it fulfils this role the Unemployment Insurance program may have a substantially beneficial impact on the growth of the economy, by inducing workers to accept riskier employment that may have a higher productivity (see Baily (1977), Stafford (1977)). Government intervention is beneficial in this case, because it reduces individual risks associated with potential future layoffs without increasing social risks.

The argument that the Unemployment Insurance system acts, in some way, as an insurance program has not, however, been unchallenged. For example, Cloutier (1978, p. 47) argues that

> "[...] when one considers that a substantial amount of program funding comes from federal income taxes, and that this funding is so strongly redistributive in exactly the opposite direction that one would use to reflect risk, the insurance analogy must lose most of its validity".

The extent to which the Unemployment Insurance program encourages growth depends on one's view concerning the causes of growth. Consider, for instance, a Shumpeterian approach to the determination of growth. According to this theory growth is induced by a succession of innovations that are ex ante quite uncertain. These industries could only attract the required labor force by offering a higher wage to compensate for the risk associated with the uncertain prospects of the venture. These higher costs may in some instances actually impede the realization of the new investment. In this respect, the Unemployment Insurance program subsidizes uncertain investments and may encourage growth.

In this way, the Unemployment Insurance program affects the economy through its impact on the demand for labor, and may increase the aggregate level of productivity, since growing and innovative ventures have higher expected productivity. Of course, this positive impact on the demand for labor must be balanced with the negative impact caused by the source of financing of the program. Indeed, the tax on wages used to finance Unemployment Insurance benefits increases the overall cost of labor and thereby reduces the demand for labor. The extra labor costs may also affect the price level.

The fact that the Unemployment Insurance program may stimulate growth through the redistribution of risk implies that the program need not be financed on a risk-experience basis to be efficient. However, it would not serve as an insurance program if it subsidised foreseen or expected periods of unemployment. A classic example is the use of Unemployment Insurance benefits to offset seasonal unemployment. Here the Unemployment Insurance program does not reduce any risk but merely

subsidizes seasonal industries by paying a part of the total compensation of workers. In effect, it subsidizes the production of goods that are produced on a seasonal basis.

However, to the extent that these industries are located in low income regions (this may be the case particularly in Canada) there may be a rationale for subsidizing seasonal industries. In this sense the Unemployment Insurance program does not act as an insurance program, but serves as an interregional transfer which may affect the regional distribution of resources via a distortion of the relative regional advantages.

Martin (1985), among others, noted that in Canada, low income regions do not pay their share according to their experience of unemployment. There is a net interregional redistribution. According to him, this creates economic distortions among industries and regions. The consequences are that: a) interregional migrations are reduced (see also Cousineau (1979)), b) seasonal and unstable employments are encouraged, c) the participation rate in the labor force is increased, d) the duration of unemployment spells is increased, and e) the above effects are stronger in high-unemployment regions since the UIB system is more non-optimal in these regions. Furthermore, Martin argues that cost-benefit evaluations of projects in lagging regions are inaccurate to the extent that they use the shadow cost of labor. This cost is understated because social measures, such as unemployment insurance, affect the unemployment duration by increasing the reservation wage. The implication is that subsidies are greater in lagging regions than they should be, implying a misallocation of resources.

The Unemployment Insurance program may also serve as vertical income transfer system in so far as more low-income individuals experience spells of unemployment. Cloutier (1978) indeed found that the Unemployment Insurance program was redistributing income from higher to lower income families; i.e. that it was progressive. He also noted an inequity in the treatment of families within income groups caused by

differences in the structure of earners from family to family. He argued that too large a portion of the U.I. benefits went to high-income families who had multiple earners when one earner experienced an unemployment spell. His recommendation was to base the U.I. program on the family rather than on the individual.

While these goals of regional and vertical redistribution of income may, by themselves, be justified, it is not clear that they should be pursued as employment-based programs. The Unemployment Insurance program may be inefficient towards achieving these goals because of the negative work incentives created by deviations from its insurance basis.

Most of the empirical literature on the effects of the Unemployment Insurance program has focused on its impact on the supply of labor. No research has been conducted to evaluate its positive impact on the demand for labour via the reduction in risks that it implies. Empirical work on this subject would be welcome. But it certainly appears difficult to establish an appropriate framework to quantify these effects. Nevertheless it appears to be an important area of empirical research. Indeed, the possibility that the Unemployment Insurance has beneficial effects on the rate of growth of the economy via a reduction in risks could have important policy implications as far as the optimal design of the program is concerned.

5. THE EFFECTS OF FAMILY AND POOR-RELATED PROGRAMS

a) Family-Related Programs

There are five elements in the family-related programs for income-security: Family Allowance ($ 2.4 billion), the Married Exemption ($ 1.4 billion), the Child Tax Credit ($ 1.1 billion), the Child Tax exemption ($ 0.9 billion) and Child Care Expense Deduction ($ 0.1 billion). All these components are financed through general government tax revenues. The exemptions and Child Care expense deduction are universal; Family Allowance is universal, but taxable; while the Child Tax credit is aimed at low-income families.

The main features of family-related programs are motivated by horizontal equity considerations. The current debate (see, e.g. MacDonald Royal Commission (1985)) and the National Council on Welfare (1983)) concerns the appropriateness of the various exemptions. It is argued that they violate the concept of vertical equity. One proposition is to abolish the exemptions and increase the amount given to low-income families. Before assessing the possible aggregative effects of family-related programs, let us first review their equity implications.

The discussion in Section 2 on equity did not elaborate an important distinction, namely between horizontal and vertical equity. Horizontal equity involves applying the tax and transfer-payment system differently to similar individuals or families, according to the specific needs created by their particular characteristics or situation. Vertical equity treats individuals and families with different incomes, but with otherwise similar characteristics or situations, on the basis of the differences in their income (see, e.g., Report of the Royal Commission (1985), p. 775).

Therefore, not only does a redistributive program need to consider the trade-off between equity, efficiency and insurance, but must also face the trade-off between horizontal and vertical equity itself. The various tax exemption items have usually been considered as providing an element of horizontal equity; for example, child, married, age, and disabled exemptions. They have recently come under attack, along with the personal exemption items, because they do not satisfy the demands of vertical equity. We turn to the issues surrounding exemptions and their effects.

First, it could be argued that the tax exemptions do not represent a cost per se to the government; they are simply foregone revenue. In this sense, the important issue is whether the exemptions redefine the appropriate tax base or are to be considered as grants for differentiated needs. Whether they violate the vertical equity criterion depends crucially on what one thinks they achieve.

Most of the discussions in this debate construe exemptions as support for different household needs. This view supposes that the appropriate tax base is the whole part of earned income. Accordingly, because of the differential marginal tax rate among income groups, the "subventions" are larger for higher-income groups. However, one can view the exemptions as redefining the appropriate tax base. In this sense one can split total income in two components - "essential" and "discretionary" income (see Sayeed (1985)). The former is the income preserved for the essential needs of a taxpayer and his dependents. The latter is what remains.

The crucial, above all ethical, question is whether the ability to pay taxes depends on total income versus discretionary income. Under the latter view exemptions do not violate the concept of vertical equity and satisfy the concept of horizontal equity. Consider, for instance, the case of child exemptions. Their elimination would imply a taxing of essential income. Even if a child tax credit is present, it only offsets

some of the tax paid, beyond the bottom income brackets, so that in some cases taxpayers with dependent children pay more than childless taxpayers with the same discretionary income (see Sayeed (1985)). The substitution of credit for child exemptions is therefore equivalent to a surtax on taxpayers with dependents. The same principles apply to the married exemption.

The family-related programs have two main channels for affecting aggregate economic variables: 1) through the labor supply incentives it creates, especially the married exemption; 2) through the saving-consumption decisions of the households. Given our purpose we shall concentrate on the second effect.

The presumption is that the program under consideration increases aggregate consumption. This conclusion depends on the extent to which 1) the marginal propensity to consume for households with children is greater than that for all households in general, and 2) the extent to which family benefits are considered a part of permanent income (see Section 4).

There are several reasons to believe that the marginal propensity to consume for households with children is greater then the marginal propensity to consume for households in general. First, we may assume that the basic needs of the former are greater than those of the latter. Therefore, if the income level of the household is close to the level needed for the basics, then households with children will consume a greater part of their income (presumably both on average and at the margin). More generally, transfers to households with children will increase aggregate consumption as long as the amount of the transfers does not exceed the additional expenses covering the care and education of their children. This consumption effect will obtain as long as these transfers are financed out of general tax revenues; that is, from an income base where the average household has a lower propensity to consume than the average household with children (see European Economic Commission (1970), p. 98).

More precisely, aggregate consumption will increase if the marginal propensity to consume from the transfer income is greater than the marginal propensity to consume out of permanent income. As for the Unemployment Insurance benefits this will be the case if the transfers affect individuals with capital constraints, a likely situation for households with children since the presence of children usually occurs early in the working life of the parents when there are inadequate opportunities to borrow against future income.

The same principles apply in the analysis of married exemptions. The effect on aggregate consumption will be greater if the married couple with a spouse not working experiences binding constraints in capital markets; for example, if one of the spouses is temporarily not working to take care of pre-school children. Again, the existence of constraints in the capital market would prevent the household from borrowing against the future income of that spouse. The effect on aggregate consumption will be smaller to the extent that the transfers change permanent income; for example, if the spouse expects not to work in the future. Here the transfers do not ease possible capital constraints.

The foregoing discussion has assumed that the life-cycle theory provides an acceptable analysis of how households determine their consumption levels (along with the existence of capital market constraints). Other theories of consumption may lead to substantially different results. For example, suppose that households determine their consumption levels by the following role of thumb: consume 90 % of all earned income and save the rest. Then transfers to families would all be saved and aggregate consumption would decrease. On the other hand, if the rule of thumb is to save 10 % and consume the rest, then aggregate consumption would increase more than predicted by the life-cycle theory. While these approaches to the determination of the consumption level may be plausible, it is generally believed that the life-cycle framework provides a more adequate and consistent framework.

b) Poor-Related Programs

The main programs related to income security for low-income individuals are: 1) Canada Assistance Plan ($ 4.1 billions for each of the federal and the provincial governments); 2) Guaranteed Income Supplement and Spouses' Allowance ($ 3.1 billion); 3) Child Tax Credit ($1.1 billion); 4) Social Housing ($ 1.1 billion); 5) Veteran's Allowance ($ 0.5 billion); 6) Social Assistance to on-reserve Indians ($ 0.2 billion), and 7) Provincial Tax Credits ($ 1.6 billions at the provincial level). All these programs are financed from general tax revenues.

The greatest economic impact of these programs is believed to be the negative work incentives created by high implicit marginal tax rates on income earned above a certain threshold. These effects have been extensively documented and the usual recommendation is to implement some form of negative income tax system. Since this topic is outside the scope of this study we shall not consider it thoroughly. Let us, however, offer some peripheral comments. First, note that not all poor-related programs are aimed at individuals expected to work. For example, single mothers with young children, the elderly and the disabled are usually not expected to be part of the labour force. The economic decisions related to work incentives may not be operative for these individuals.

A negative income tax system would certainly remove many of the negative incentives to work created by the present system. However, it does not permit "tagging" those in need which may imply a high marginal tax rate on higher income. As Akerlof (1978, p. 17) argued:

> "(...) with a negative income tax, a grant is made to all taxpayers and this grant must be recovered to achieve the same net revenue. This recovery results in high marginal tax rates, whose disincentive effects are the major disadvantage of a negative income tax. This disadvantage, however, must be weighted against the disadvantages of tagging, which are the perverse incentives to people to be identified as needy (to be tagged), the inequity of such a system, and its cost of administration".

In this context, a manpower program directed at those expected to work may be more efficient then a negative income tax system (since it effectively tags those in need), even if its benefit-cost ratio does not exceed one. The efficiency of a negative-income tax system compared to the current-system with a manpower program would depend on the proportion of individuals in need who could be expected to work; i.e. those who would respond to economic incentives to increase the supply of labor. Indeed it appears that additional empirical work would be useful in assessing first the proportion of welfare recipient who are able to work and the benefit-cost ratio of the various manpower programs proposed. These could have potentially important policy implications with respect to proposals such as the negative income tax system.

The analysis of how poor-related programs affect the consumption-savings decision follows much the same direction as our previous analysis of child-related benefits. The transfers affect aggregate consumption insofar as they alleviate existing constraints. However, there are several reasons to suggest that recipients of poor-related transfers would not use these benefits to increase savings. First, the level of the benefits is usually quite low, in many cases not covering adequately basic needs. Since these programs are income-tested, the benefits received are a large fraction of total income. There is little scope for possible savings and most likely all benefits would be consumed. This could be the case even if capital markets were perfect and permitted borrowing against future income, where the period of need were lengthy or occured when the individual was elderly (GIS and aid to the permanently disabled are clear examples). If the period of low-income is relatively short, there may be some possibility to use previous savings and, though it is less likely, to borrow against future income.

On the whole, it is unlikely that a significant amount of these transfers would be used to increase savings and we should, therefore, expect poor-related programs to have strong positive effects on aggregate consumption since they are financed out of general tax revenues.

6. NOTES ON THE COMBINED EFFECTS OF THE INCOME-SECURITY PROGRAMS

In this section we shall present an overview of the likely combined effects of the income-security programs discussed previously on various macroeconomic variables. The aggregates of note are the level of output, the unemployment rate, the growth rate of GNP, the cyclical stability of the economy, and the inflation rate. We shall also mention briefly the potential effects on Canada's international competitive position and immigration. To start, let us discuss the short-term and long-term impacts of savings and consumption decisions.

a) Savings versus consumption

In discussing pension-related programs we have argued that decreased savings (or increased consumption) by individuals in response to anticipated retirement transfers could be detrimental to the economy. By contrast, the analysis of the other social programs presupposes that increased aggregate consumption would be beneficial. What is needed: increased aggregate savings or increased aggregate consumption? Why is increased aggregate consumption to be avoided when considering pensions and an objective when considering other programs? The answer depends, to a large extent, on the potential stabilizing effects of the various programs.

It is generally believed that the effects of age-related programs are long term. Though these programs may be influenced by short-term cyclical conditions, the ensuing effects are small compared to the potential long-term effects on savings. On the other hand, it is the presumption that the other programs generally have short-term effects. If these programs are themselves influenced by cyclical economic conditions (increased benefits in downturns) and there is some slack in the economy, we would indeed want an increase in the magnitude of these programs to increase aggregate consumption. A number of income security programs would then act as automatic stabilizers.

Whether the income-transfer program have a stabilizing effect on the economy is an empirical question which we shall address later. We need first to analyse whether the combined effect of income-transfer programs is to increase the level of aggregate demand.

b) **Effects on the level of output**

As we have noted in the previous sections, most programs tend to increase aggregate consumption essentially because they involve income transfers from individuals with low propensities to consume to individuals with high propensities to consume. Danziger, Haveman and Plotnick (1981b), p. 246) summarize the effects:

> "(...) public income transfers accrue largely to low-income households that tend to have a higher than average propensity to consume. Thus, the programs help raise aggregate demand which induces increased production and a higher level of GNP. This GNP effect is increased by the income stabilization effect of transfer programs. Because transfer benefits reduce income fluctuations, recipients expect a more secure income stream, this raises permanent income and leads to increases in consumption."

They argue that the total effect of income transfers in 1976 on the U.S. economy was an increase of consumption spending by 3 to 5 percent. The effect on the level of GNP was estimated to be 3.5 %. No estimates are available for Canada.

The effect of increased consumption spending on GNP depends, of course, on the existing economic situation. If the economy is operating at less then full-employment, increased consumption spending will result in increased output and employment and, thereby, in increased total savings as well. If the economy is operating at or near full employment levels, the programs would result mainly in increased prices. Danziger, Haveman and Plotnick argue that the economy has been characterized by excess capacity during much of the period during which income-transfer

programs have been in place. Their effect was therefore to increase the level of total output. The European Economic Commission (1970) reached essentially the same conclusion.

c) Effects on the unemployment rate

The effects of the transfers on the labor market is closely related to their effects on labor supply. These considerations are outside the scope of the present study. Let us, however, discuss some implications as far as the measured unemployment rate is concerned.

Transfer programs influence the measured rate of unemployment through three main channels: 1) by increasing the time spent searching for a new job, 2) by subsidizing unstable employment and 3) through work registration regulations.

The first channel operates mainly through the Unemployment Insurance program. The latter reduces the opportunity cost of not working and of searching for a better job. Although this increased unemployment represents a real loss of productive resources, the extra time spent searching may increase the efficiency of the labor market by providing better "associations".

Because the Unemployment Insurance program is not experience-rated, it allows a subsidy to industries with unstable patterns of employment. This features may encourage such businesses to increase the amount of temporary, seasonal and cyclical fluctuations in their output and employment (because Unemployment Insurance raises the net wage expected by workers). As was argued in Section 4, these effects must be balanced against the beneficial impact the Unemployment Insurance program has in redistributing risk with possibly positive consequences for growth.

Finally, other income-transfers programs may increase unemployment, though their direct effect in this direction is likely to be small.

Nevertheless, these programs may have substantial effects on the measured unemployment rate if they require their beneficiaries to register for work as some do in the U.S.. Some of these beneficiaries may more appropriately be counted outside the labor force. This effect on measured unemployment is likely to be more important for the United States than for Canada, because of U.S. regulations governing the Food Stamps and Aid to Family with Dependent Children programs.

In the United States it has been argued by Danziger, Haveman and Plotnick that the combined effects of the transfers program is to add 1 to 2 percentage points to the late 1970's unemployment rates.

d) Effects on the growth rate of GNP

The income-transfer programs may have a negative impact on the growth rate of GNP to the extent that the induced increase in aggregate consumption does not result in higher levels of output, because the economy is operating at or near full-employment. In this situation, the result would more likely be an increase in prices and a substitution of consumption for personal savings. If this reduction in personal savings in not accompanied by a corresponding shift in public savings, foreign inflow of capital or retained corporate earnings, total savings will decrease. This decline would lower the rate of new capital investment, thereby affecting future economic growth.

As we argued in section 3 the evidence covering the effect of age-related programs on personal savings is rather inconclusive. Overall, there does not appear to be a significant effect. The other programs increase aggregate consumption as argued above. The ultimate result clearly depends on whether the economy operates at or near full employment. If there is excess capacity, then transfers are likely to increase the rate of growth of GNP; if not, savings will decrease and long-term growth rates are negatively affected.

On the other hand, transfers may have both negative and positive impact on the supply side. There is the initial presumption that transfers significantly alter work incentives, thereby reducing the rate of growth of production. Yet they may actually create a less risky environment, and so have a positive impact on innovation and productivity which would tend to increase the rate of growth. Furthermore, income transfer programs may have a positive impact on the long-run growth rate of output via its effects on human capital formation.

As noted in the introduction, the rate of growth of the economy and the size of the so-called welfare state are likely to be closely related (along with other government activities in general). There is a strong presumption that growth permits an increase in income security programs. On the other hand, the effects of large transfers on growth are still unclear.

Blais and McCallum (1986) recently studied the possible determinants of economic growth. They found, using a sample of 16 OECD countries, that a measure of the strength of special interest groups and the change in total government spending affected negatively the rate of growth of GNP. But their strongest result is that there is a positive and very strong association between economic growth and the level of social security transfer payments (as a percent of GNP) at the beginning of the period (whether or not social security payments are adjusted for differences across countries).

The explanation they propose for this association is that the presence of a Welfare State creates a better social consensus (p. 180):

> "[...] the welfare state may create a climate of social consensus that results in better labour-management relations, greater political stability, a higher degree of cooperation among the "social partners", and less alienation at the workplace. All of these factors may contribute to higher productivity and higher economic growth."

The policy implication that they draw from their analysis is that it would be desirable to curtail government activities directly influenced by pressures from special interest groups, "while at the same time maintaining or even expanding the basic institutions and programs of the welfare state" (p. 186).

Their argument, however, relies on the belief that the direction of causation is indeed from social security transfer payments to economic growth and not the other way around. As discussed in the introduction, Abramowitz (1981) argued that economic growth permitted a larger Welfare State so that, according to him, the direction of causation is from growth to transfer payments. Blais and McCallum argued that the latter explanation would imply an association between high growth rates and high increases in social security payments, not between high growth rates and high levels of social security payments. To put it differently, it would imply an association between high levels of social security payments in relation to GNP in rich countries, not in fast growing countries. Given that in their sample the richest countries tended to be the slowest growing countries, they rejected the idea that causation was from growth to welfare payments.

This argument does not convincingly preclude the possibility that the causation may run from growth rates to welfare payments. For instance, such a causality could be associated with a relationship between high rates of growth and high levels of transfers if the high rates of growth have been in place for some time. There is evidently a need to try to assess, through direct methods, the most likely direction of causality. There is, as of yet, no such study available in the literature.

e) **Effects on the cyclical stability of the economy**

The consequences of income-security programs for cyclical stability depends on the procyclical or anticyclical behavior of four factors: 1) the number of individuals receiving benefits, 2) the size of the benefits, 3) the number of individuals contributing, and 4) the size of the contributions.

It is widely assumed that the number of individuals receiving benefits varies anticyclically. This is due mainly to the variations in the number of unemployed workers (through variations in layoffs) and in the numbers of individuals above or below some proverty line (through variations in earned income). Some risks, however, may vary procyclically such as work injuries and industrial health hazards, but their magnitude is much less than those operating anticyclically (see EEC Commission (1970)). A number of other risks are more or less neutral with respect to changes in the aggregate level of production; the number of elderly, the number of children (for family allowance), and most disabilities. Overall, the number of individuals entitled to income-security benefits varies anticyclically mainly through the number of unemployed.

The cyclical nature of the real value of the benefits depends on the precise decision-making process which determines the level of these benefits. Suppose the benefits are indexed to the current price level. This would imply that benefits rise more in periods of excess demand and less in periods of excess capacity; this decision process leads therefore to a procyclical movement. This procyclical nature would be attenuated, if benefits were linked to increases in labor productivity.

This problem is complicated by the nature of the political process determining the size of the benefits. In effect, as real income increases there is a greater tendency to increase benefits for purely social reasons. Indeed, as real income is high it is easier to finance

increased benefits without reducing the real disposable income of contributors. The procyclical nature of the magnitude of the benefits is therefore especially apparent in expansion phases. As the EEC Commission (1970, p. 162) noted, there is a trade-off between social goals and income stabilizing effects of social security:

> " [...] l'expérience a montré que, notamment dans les périodes de haute conjoncture, un conflit se fait jour entre les objectifs de la politique conjecturelle et ceux de la politique sociale: c'est précisément lors d'une surchauffe conjoncturelle que tendent à apparaître des hausses de prix qui affectent tout particulièrement les couches sociales relativement pauvres des pensionnés sociaux. Dans de telles conditions, il paraît impensable, sur le plan de la politique sociale, de faire supporter uniquement par les pensionnés la charge de stabiliser la conjoncture."

The EEC Commission also argued that, especially in expansion, the procyclical nature of the size of the benefits outweighed the anticyclical nature of the number of individuals covered. This is less apparent in a recession, so that the overall effect may be anticyclical in downturns.

As far as the revenue side of the programs is concerned, it is generally believed that both the number of contributors and the size of the contributions vary procyclically. Indeed both increase in expansion, because employment and income increases.

As far as the total effect is concerned let us quote the conclusion of the EEC Commission (1970, p. 180).

> " [...] nous inclinons à considérer comme principalement procyclique l'incidence de l'ensemble du domaine de la sécurité sociale sur les fluctuations de la conjoncture lors de longues périodes de haute conjoncture.
>
> En revanche [...] dans une phase de dépression, la hausse des prestations, la baisse des cotisations et le financement du déficit du secteur social auront dans l'ensemble une incidence anticyclique."

Empirical analyses of the stabilizing effects of income-security programs are few and relatively old. Among them are Jeanjean (1977) and Snyder (1970). Snyder analysed the effects of income-security programs in seven OECD countries from 1955 to 1965. He found that the stabilizing effects were small and noted that (p. 272) "for those countries where it is possible to distinguish between automatic and discretionary effects, the former appear to have been generally stabilizing, but as often as not discretionary changes have been destabilizing, because of modifications in the contribution and benefit rates at inappropriate times". It remains to be seen whether this conclusion is also valid for the period since 1965.

Jeanjean (1977) used a simulation approach to assess the stabilizing effects of social security programs in France. His model is calibrated econometrically over the period 1962-1972 and makes forecasts over the five-year period 1973-1977. The forecasts are computed from a small number of economic parameters taken to be exogeneous and to have an important influence on benefits and contributions of social security: the increase in the number of employed people, the average and minimimum wage increases and the increase in consumer prices. The model analyses only "the Régime Général" which covered two-thirds of the French population in the early seventies. His simulation results are based on various specific scenarios abouth the rate of increase of the exogeneous variables. Each benefit is forecasted independently and the results are then aggregated.

The result obtained is that the social security system in France has stabilizing effects on aggregate economic activity. Following a wage increase, the social security budget balance improves and private disposable income is reduced, thus having a deflationary effect on demand. Conversely, if the wage increases are lowered, the social security balance deteriorates, disposable income increases and aggregate demand is stimulated. "The stabilizing effects of the social security systems are mainly due to the fact that, for a given year, contributions vary with wages, while income transfers are almost independent of

economic fluctuations" (p. 217). This implies a difference in the adjustment lags between contributions and benefits following price and wage increases. The results crucially depend on the fact that contributions are closely tied to the previous year's wage level. If the social security system was financed solely from general tax revenue, the stabilizing effects would vanish according to this model. Finally, Jeanjean noted that social security benefits are useful policy tools only in one way due to the fact that, politically, it is easy to increase benefits while it is very difficult to decrease them. So benefits can be increased to stimulate the economy but cannot be reduced to control inflation.

f) Effects on Inflation

Government income transfers are not inflationary per se. However, to the extent that the increase in transfers in a full-employment context are not offset by increased taxes, transfers will have an inflationary impact. But this impact is due to the overall deficit and is the same as any other fiscal activity.

Income security programs may more significantly influence inflation through their incidence on the labor market. Income transfers may increase a worker's reservation wage and contribute to increased wage and price pressure at any level of aggregate demand. Danziger, Haveman and Plotnick (1981b) refer to this phenomenon as a "policy-induced shift in the Phillips Curve". Other effects concern the costs of in-kind transfers, such as education and health maintenance. The increase in costs is essentially due to the fact that the bills are paid by a third party thereby reducing the incentives to rationalize the operations.

g) Other Effects

The various income security programs may have a number of demographic effects, but their empirical relevance is highly uncertain. Examples include changed living arrangements, by making it possible for a

single mother to live without a spouse, changes in the number of children through the benefits of various child-related programs, etc. These programs may also affect locational choices and interregional mobility; for example, regions with high levels of welfare benefits may attract low-income persons for the benefits themselves or the better anticipated cushion in case of poor earnings.

On the international level, the size of contributions for income transfers may have an impact on Canadian competitivess with other countries, because they raise the effective costs of labor. However, the relevant variable is the total wage tax and depends on all other government activities. While one country may have high income-transfers, another may have a larger defense budget so that the overall financing needs may be similar. (This does not imply that impacts of different spending categories are the same; they obviously depend on factors such as the externalities they create). The transfer programs are also likely to have some effects on international migration.

The list of effects could probably be extended; however, almost no empirical estimates are available and the theoretically implied effect of economic incentives are often not clear.

7. THE EFFECTS OF ECONOMIC CONDITIONS ON THE INCOME-SECURITY PROGRAMS

As we discussed in the introduction, the growth of the economy permits the implementation of income-security programs by increasing the real resources devoted to these transfers without reducing the real disposable income of the contributors. However, growth may also have direct effects by increasing the earned income of individuals and lifting them out of poverty. Indeed, it is a common belief that growth acts as "a rising tide which lifts all boats". Recently President Reagan argued that poverty would be much better handled by economic growth in general than by welfare programs. The argument was used to justify major cuts in these programs. As Danzinger (1983, p. 69) argues: "The Reagan program assumes that those who remain poor will be better off waiting for economic growth to trickle down from those above them rather than relying on welfare and public jobs programs."

Does growth per se have such a beneficial effect on poverty? Can we expect such a trickle-down effect to occur in the present economic context? Most empirical analyses conclude that growth played an important role in alleviating poverty in the immediate post-war period, but that this effect has dissipated subsequently. Let us look at some of the reasons why growth may not now have the same impact in reducing poverty then it had before (see Danzinger and Gottschalk (1986)).

First, there are changing demographic factors. In 1979 two-thirds of all poor households were headed by individuals generally not expected to work (elderly, student, disabled, or a woman with a child under age 6). In 1939 the proportion was less than one third. It is clear that growth alone cannot eliminate poverty for households whose heads have such a tenuous attachment to the labor force. They could benefit indirectly if the increased tax revenue obtained was redistributed through antipoverty programs.

Secondly, growth not only changes the mean of income distribution but also its shape. Changes in the variance and other moments of the distribution will also have an impact on poverty. There is no a priori reason to believe that an increase in mean income automatically reduces the number of households under some poverty level. Indeed, it seems to be the case that growth increases the inequality of the income distribution as well as its mean.

Thirdly, even abstracting from changes in inequality, there is a non-linear relationship between growth (through an increase in the mean) and poverty. "[...] as long as the poverty line falls to the left of the mode of the income distribution, fewer and fewer people will be taken out of poverty as the distribution shifts to the right" (Danziger and Gottschalk (1986), p. 406). In a sense, there are diminishing returns for the poor via economic growth.

A further distinction must be drawn between secular growth and cyclical recovery to understand the impact of macroeconomic conditions on poverty. Secular growth reflects increases in potential output due to increases in productivity and factor supply. It accounts for the long term trend in the growth of output which operates primarily through higher wage rates. Increased investment and technological changes will increase the growth potential of the economy. However, over a short period of time, this increased potential is realized more easily by increasing the number of hours an unemployed person works than by increasing the productivity of a fully employed person. Therefore, cyclical recovery operates mainly via an increase in the quantity of labor employed. Accordingly, improvements in cyclical conditions will have a much greater impact on poverty than secular growth. First, the yearly secular growth in mean-income is small compared to cyclical increases. Secondly, growth may be accompanied by increased inequality.

Buse (1982) analysed the cyclical behaviour of the "size distribution" of income in Canada for the period 1947-1978 using individual tax returns. He found that neither the rate of inflation nor

the level of unemployment has a significant effect on the Gini index or the quintile shares. The only significant variable is the labor force participation rate which, when increased, equalizes the distribution of income. In the bottom decile, increases in employment and participation rates have equalizing effects; while in the top decile there is some evidence that increases in profit shares increase inequality. These results do not imply, however, the absence of any cyclical effects from reduced unemployment on the rate of poverty because it may be possible that the whole distribution shifts upward in recovery (leaving the decile shares unaffected).

Danziger and Gottschalk (1986) analysed the U.S. data from 1949 to 1979. The data covers only men aged 25 to 64 to abstract from the effect of demographic changes. The proverty rates were 33.1 % in 1949, 16.2 % in 1959, 7.7 % in 1969 and 7.1 % in 1979. The change in poverty rate due to changes in the mean of the distribution was -13.8 % from 1949 to 1959, -6.1 % from 1959 to 1969, -1.3 % from 1969 to 1979. The differences due to changes in the shape of the distribution were: -3.1 % from 1949 to 1959, -2.4 % from 1959 to 1969, and +0.7 % from 1969 to 1979. The data shows that during this period the rise in the mean of the income distribution was the primary cause of the decline in poverty, but that this effect decreased substantially over time primarly because of the falling rate of secular growth. The data also shows the occurence of increased inequality since 1969 with adverse effects on poverty.

During the period from 1969 to 1979, inequality increased both in recessions and recoveries; there was increasing poverty in each situation. However, the impact of cyclical variations is such as to make the poverty rate vary countercyclically. It appears, therefore, that cyclical variations have a greater impact than secular growth on poverty. In an earlier study, Thornton, Agnello and Link (1978) reached a similar conclusion to the effect that the impact of growth had considerably declined since World War II. Their recommendation for future policy is as follows (p. 394):

> "Since primary reliance on future economic growth to reduce poverty will be largely unsuccessful, expanded programs directed specifically at poor families will be required if poverty is to be eliminated."

Gottchalk and Danziger (1985) analysed the period 1967-1982 with particular emphasis on the role of transfers in reducing poverty. First, they note that from 1967 to 1979, the percentage of individuals in poverty had decreased for each category considered: all persons, young men, prime-age men and the elderly. However, from 1979 to 1982 all groups, except the elderly, experienced increases in poverty rates larger than the decline from 1967 to 1979. For all groups changes in the shape of the income distribution contributed to increases in the poverty rates for both periods. The effects on poverty of changes in mean market income-to-needs ratio were negative in the period 1967-1979, but positive in the period 1979-1982. The effects of changes in mean transfer income-to-needs ratio were not significant for young men and prime-age men, but contributed to a 21.1 percentage point decline in the elderly poverty from 1967 to 1979. This results shows the impact of increased old age security on the poverty rates of the elderly. Since 1979 the decline in market income has increased the poverty level and the benefits of growth have considerably declined; rising inequality was especially significant in increasing poverty.

Based on the conclusions of the above-mentionned studies, it does not appear, therefore, that growth will have much of an impact on welfare programs, even apart from the fact that the rate of growth itself has decreased. The conclusion advanced in the literature is that the "trickling down" effects of growth on poverty have substantially diminished in importance and are expected to remain low in the near future. A more effective way of alleviating the need for welfare programs would attempt to reduce the large unemployment rates we are now experiencing. There is some evidence that high unemployment rates are associated with high rates of welfare dependence. Indeed Vaillancourt and Grigon (1986) found that the unemployment rate had a significant

positive impact on the ratio of beneficiaries to total population both for the province of Québec and Canada as a whole, while the price variable (the wage/benefit ratio) was insignificant. (See also Gustafsson (1984) for Sweden; and Spindler and Gilbreath (1979) for Canada). There are also indirect positive effects of decreased unemployment rates in that reduced cyclical instability reduces uncertainty and so may increase the future prospects for gains on leaving welfare programs.

Increased economic stability may also have an impact on the costs of the welfare program due to the possible non-linear relationship between the level of GNP and welfare recipients along a given economic cycle. It may be the case that there is a greater increase in the number of welfare recipients during a downturn than a corresponding decrease occuring in the upturn. This non-linear relationship could be explained by reference to the idea of a 'poverty trap'. This idea suggests that it is easier to get into poverty than to get out of it. A possible reason is that the time spent on unemployment or prolonged sickness, may imply a decrease in human capital formation and the acquisition of experience. This in turn implies a loss of competitiveness in the labor market and a decrease in the probability of acquiring a job as the length of the absence from the workforce is increased. This analysis, however, remains an empirical matter which has yet to be investigated.

8. CONCLUDING COMMENTS

As the present survey demonstrates, the interactions of the income-security system with the market economy are quite complex. These relations are further complicated by interactions which were not explicitly covered in this study. For example, the income-security system has wide implications concerning the operation and efficiency of the labor market, especially with respect to the negative work incentives it may cause.

A potentially more important set of interactions occurs when other government activities are considered. The income transfer system surely has many interrelations with government provisions of various goods and services and, in particular, with the budget deficit and the stock of debt. Since a large fraction of the income-security programs are financed from general tax revenues, these programs may "bear some responsibility" for the size of the deficits. As is widely acknowledged, the government deficit has many economic implications, as well as inter-generational distribution consequences. What part of the responsibility for the deficit and accumulation of debt by the government is to be imputed to the income-security system is a highly debatable question.

Is the size of the unified deficit determined, to a larger extent, by short-range fiscal policy? Consider pensions. If such is the case, the creation of a surplus fund for the social-security system may be counterbalanced by a larger budgeting deficit to achieve the same fiscal effect. Then aggregate savings would not be increased. As Thompson (1983, p. 1444-5) argued:

> "[...] An accumulation of Social Security reserves will increase aggregate saving only if the accumulation translates directly into reductions in the unified budget deficit or increases in the unified budget surplus and, by the same token, any other method of increasing the unified budget surplus will have the same effect on saving as the accumulation of Social Security reserves.
>
> [...] the question of whether we increase our saving rate by creating large Social Security reserves is, in large part, an issue of intercohort redistribution, not economic efficiency."

On the other hand, the deficit may be caused by the political process which creates incentives for politicians to transfer, presumably inefficiently, the burden of their policies to future generations. In this case the income-security programs in general have the same pro-rated "responsibilities" as any other government spending activity. The argument advanced for the curtailing of social security programs is generally that these are natural places in the government structure in which to locate public savings. But this issue is none other than to determine if the desirability of a government program outweighs its costs of increased taxes.

The present study identified a number of potential impacts the income-security systen may have on various macroeconomic variables of interest. A feature worth stressing is that, in many instances, the empirical studies (and to some extent the theoretical ones also) do not reach a consensus as to the most likely macroeconomic impact of the income-security system. For example, there is no agreement as to whether public pensions financed on a pay-as-you-go basis reduce aggregate savings, or whether unemployment insurance actually reduces the rate of growth of the economy. Clearly more work is needed to try to assess the most important impacts and undoubtedly more work will be produced due to the importance of both the costs and the potential effects of the various programs.

An important point to bear in mind, however, is that even if a particular program or set of programs has a negative impact on one section of the economy or another, it does not follow that the reduction or elimination of these programs is the most efficient way to yield corrective actions in that sector. Usually many tools are available to influence a specific variable or set of variables. For example, even if we could conclude that a pay-as-you-go public pensions scheme causes a decrease in aggregate savings and a suboptimal level of capital stock, it does not follow that its elimination is the most efficient way to increase the capital stock. Appropriate changes in the government deficit or various investment tax incentives may yield the desired result

without the various negative impacts the elimination of the present pay-as-you-go system may have (decreased investment in human capital is one example).

The proper course of action, therefore, depends also on factors outside the framework of the income-security system itself. A proper cost-benefit analysis of the various possible courses of action may be more appropriate than assigning the elimination of a possible cause as the only remedy, especially if the cause is only a by-product of other factors.

In light of these comments, a possible course of action for future research would be to analyse the various effects considered through a detailed empirical model of the Canadian economy. An avenue which follows such an approach may be to consider a type of empirical general equilibrium model. The work of Fortin and Rousseau (1984) in this domain could provide a valuable starting point. Future work of this kind would have the advantage of permitting the analysis of quite complex interactions among the income-security system and the rest of the economy, interactions which are, as highlighted in this survey, potentially very important.

NOTES

1 The figures for the United States are of the same order of magnitude. For the total number of individuals, the figure was 22% in 1959 and 12% in 1980 (7% if in-kind transfers are included, e.g. food stamps and medicaid); see Danziger, Haveman and Plotnick (1981b) who argue that this decrease in poverty cannot be atributed to growth per se but results mainly from cash and in-kind transfers. Indeed, pre-transfer income basically leads to the same level of poverty today as existed 30 years ago. For the U.S., if only earned income is considered, the aggregate incidence of poverty is about 21% (1980 figures) (see Danziger, Haveman and Plotnick (1981b)).

2 For recent reviews of the effects on work incentives, see Cousineau (1986a), Fortin (1986), Danziger, Haveman and Plotnick (1981a).

3 For a critique of this analysis, see Veal (1986). Veal argues, among other things, that polling evidence suggests that the current young (who are financial losers from public pension programs) in fact strongly support the program.

4 Personal tax exemptions account for approximately $14 billion. The following figure also excludes smaller programs such as Veteran's Allowances, training allowances and social assistance to on-reserve Natives. The figures quoted in the text are from the "Report of the Royal Commission on the Economic Union and Development Prospects for Canada", vol. 2, page 772, to which to reader is referred for further descriptions of the programs.

5 Note, however, that not all authors agree with the view that most differences in income cannot be explained by observed socio-economic characteristics. For example Vaillancourt (1986), in the Canadian context, argues that age (or experience) and education explain most of the differences in income. But again, this observation refers to cross-sectional comparisons rather than to the more temporal ones used by the studies cited previously.

6 For an excellent review of the details of each program, see Hamilton and Whalley (1984), and Ethier (1986). For the case of the United States see, among others, Danziger, Haveman and Plotnick (1981a, b) and Thompson (1983).

7 Let D be the age of death and R the age of retirement; then the lifetime budget constraint is

1) $$\int_0^D C(t)e^{-rt}dt = LTW \equiv \int_0^R W(t)e^{-rt}dt$$

where LTW refers to lifetime wealth, C(t) to consumption at time t and W(t) to the earning stream. With a social security system yielding benefits B(t) in retirement and taxing earnings at rate θ in working years, the lifetime wealth is given by

2) $$LTW \equiv \int_0^{R'} W(t)(1 - \theta)e^{-rt}dt + \int_R^D B(t)e^{-rt}dt.$$

where R' is the age of retirement optimaly chosen by the individual given the existence of the social security system. R' need not equal R.

8 For simulations of the effects of demographic changes, see Seidman (1983), and for the role of the old-age dependency ratio as a shadow price determining the optimal quantity of social security, see Turner (1984).

9 For some empirical evidence suggesting that the social rate of return on investment in human capital is greater than the social rate return of physical capital, see Vaillancourt et Henriques (1986).

10 Excellent reviews of the empirical literature can be found in Aaron (1982), Danziger, Haveman and Plotnick (1981a, b), Thompson (1983), Boadway and Kitchen (1984), Ethier (1986) and Esposito (1978).

11 Here, the poverty rate is the one defined by the Bureau of Census of the U.S.. The nominal levels of the poverty line are deflated with the CPI to make intertemporal comparisons.

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